ICF-24

SERVICE MANUAL

US Model
Canadian Model
East European Model
E Model

Photo: US, Canadian model

SPECIFICATIONS

Frequency range:
FM: 87.6—108MHz (US, Canadian, E model)
65—108MHz (East European model)
AM: 530—1,710kHz
Speaker: Approx. 7.7 cm (3 inches) dia., 4 Ω
Power output: 350 mW (at 10% harmonic distortion)
Output: Headphones jack (stereo minijack)
Power requirements: 120 V AC, 60 Hz with the equipped AC power cord (US, Canadian model)
220—230V AC, 50Hz with the equipped AC power cord (East European, E model)
6 V DC with four size AA (R6) batteries
Battery life:
Approx. 26 hours
(for four hours a day at normal volume using Sony batteries SUM-3 (NS))
Dimensions:
Approx. 217 × 117 × 80 mm (w/h/d)
(8 5/8 × 4 5/8 × 3 1/4 inches) incl. projecting parts with the carrying handle pushed in.
Mass:
Approx. 730 g (1 lb 10 oz) incl. batteries (EXCEPT E)
Approx. 760 g (1 lb 10 oz) incl. batteries (E)

Design and specifications are subject to change without notice.

Features

- 2 way power AC/DC operation
- TUNE indicator which lights during radio reception
- Carrying handle

FM/AM RADIO

SONY®

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

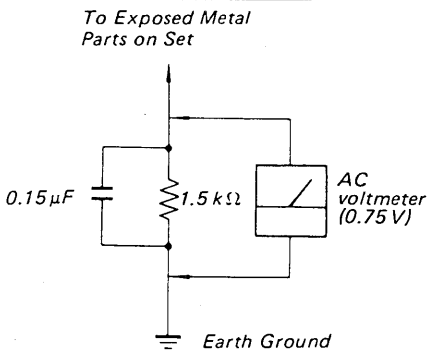
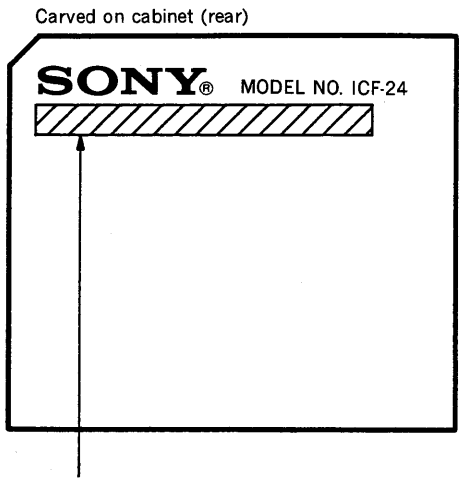


Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MODEL IDENTIFICATION
—Model Number label—



US, CND model : AC : 120V~60Hz 4W
EE, E model : AC : 220—230V~50Hz 4W

- Abbreviations
  CND : Canadian model
  EE : East European model

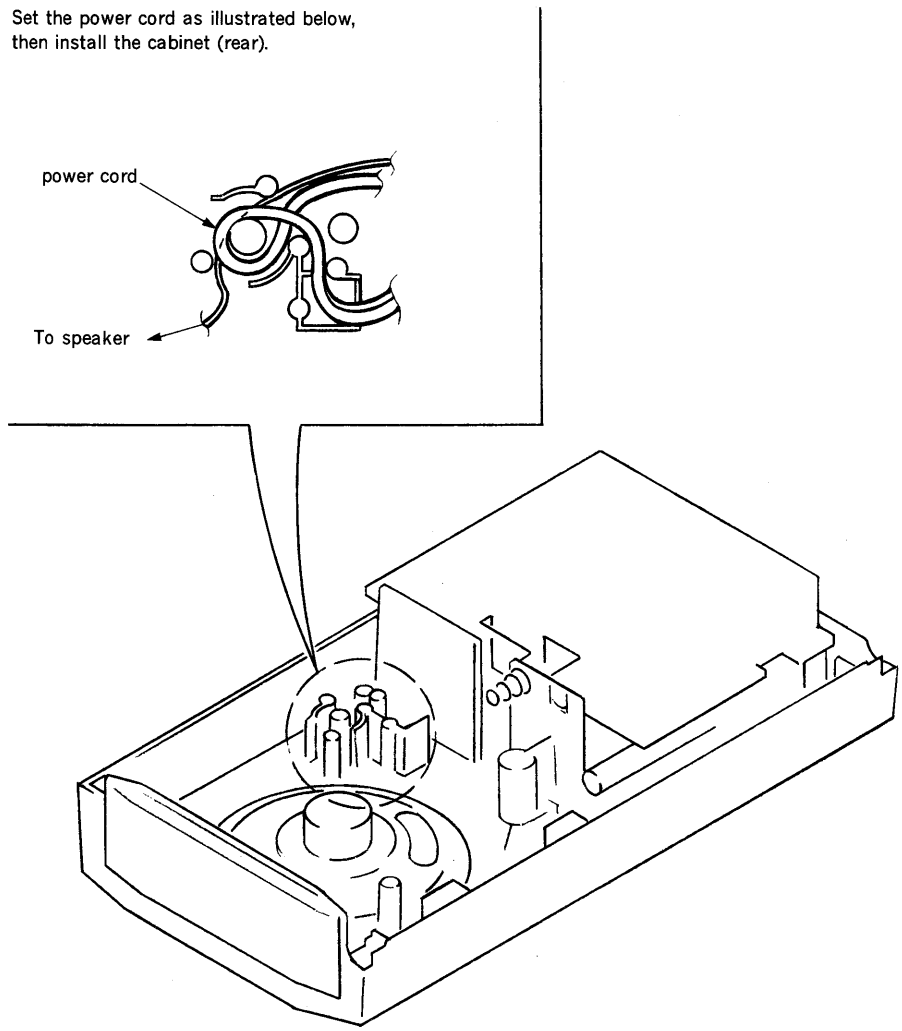
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

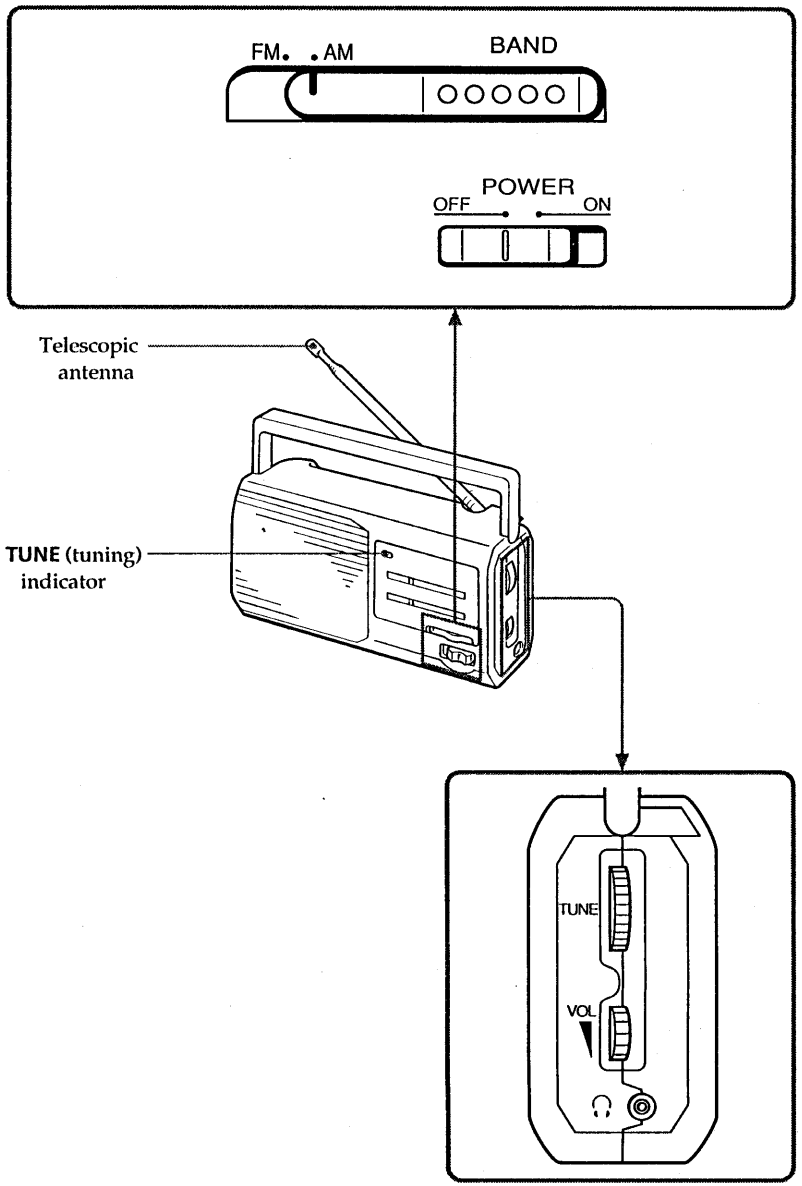
LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1
SERVICE NOTE

1-1. SETTING THE POWER CORD

Set the power cord as illustrated below, then install the cabinet (rear).



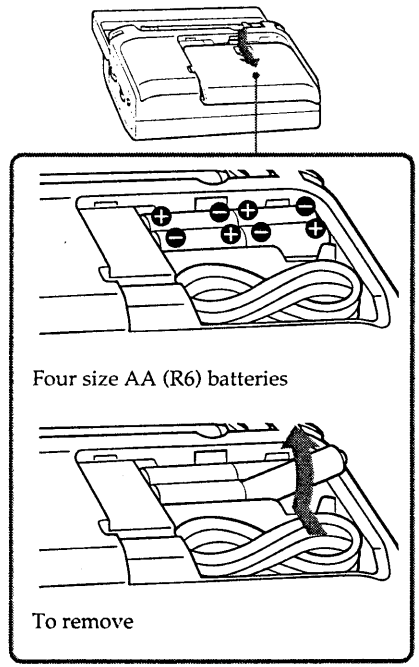


Installing the Batteries

For battery operation, this unit needs four size AA (R6).

Rear

Battery and AC power cord compartment



Four size AA (R6) batteries

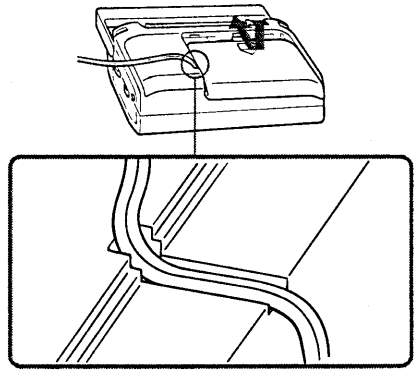
To remove

Knowing When to Replace the Batteries

When the sound becomes weak or distorted, replace all the batteries with new ones. Concerning battery life, see "Specifications".

Using the AC power cord

When you use the AC power cord, set it into the groove properly, then push the lid of the compartment and slide it in the direction of the arrow to close the compartment properly.



Playing the Radio

1. Slide **POWER** to **ON** to turn on the radio and adjust **VOL** (volume).
2. Select **FM** or **AM** and tune in to a station using **TUNE** (tuning).

- To turn off the radio, slide **POWER** to **OFF.**
- To improve radio reception
  FM: Extend the telescopic antenna and adjust the length, direction and angle for the best reception.
  AM: Rotate the unit horizontally for optimum reception. A ferrite bar antenna is built into the unit.
- ∩ (headphones) jack (right side of rear cabinet)
  When optional accessory headphones are plugged into the headphones jack, it automatically silences the radio speaker and the listener can enjoy complete privacy.
  The jack is designed to be used for the stereo headphones with your monaural radio, but reception will be heard in monaural only.
- **TUNE** (tuning) indicator
  The indicator lights up when a station is tuned in.

Notes

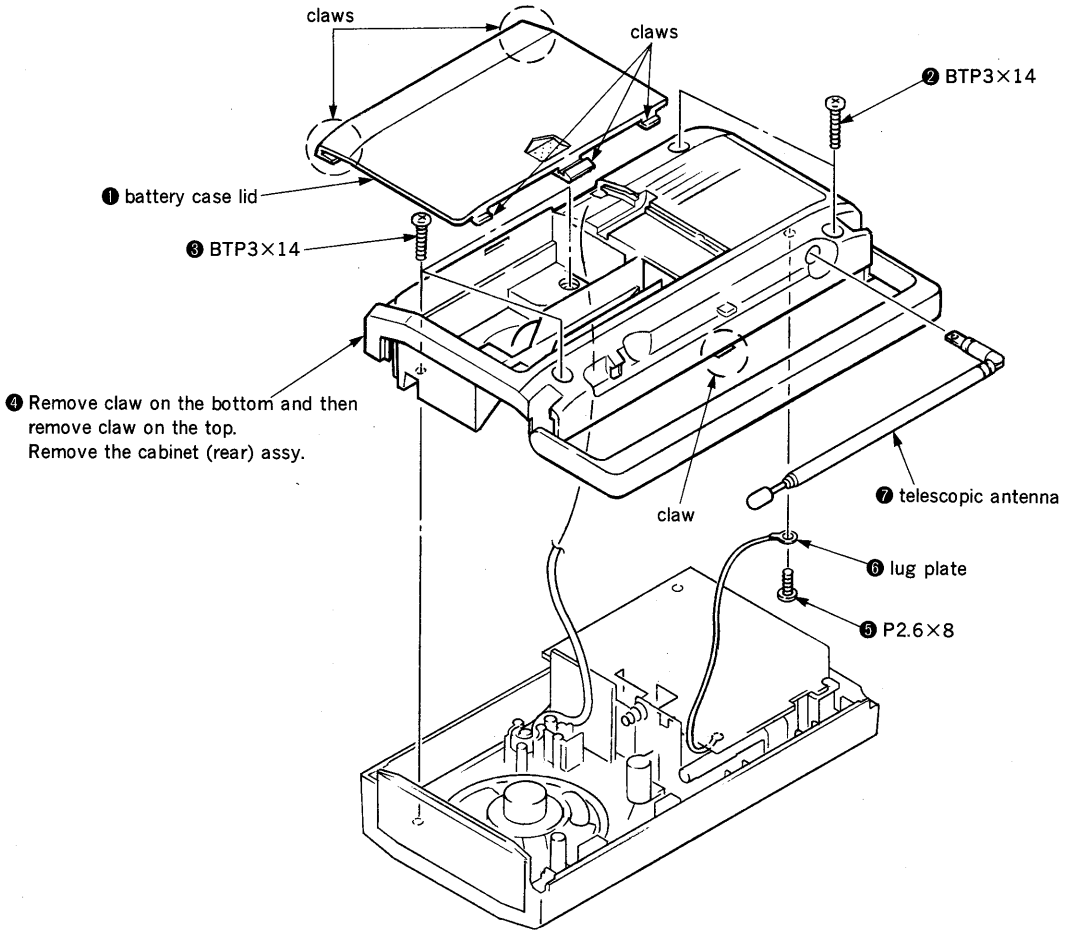
- In vehicles or buildings, radio reception may be difficult or noisy. Try listening near a window.
- Keep the radio away from metallic objects.

This section is extracted from instruction manual.

SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

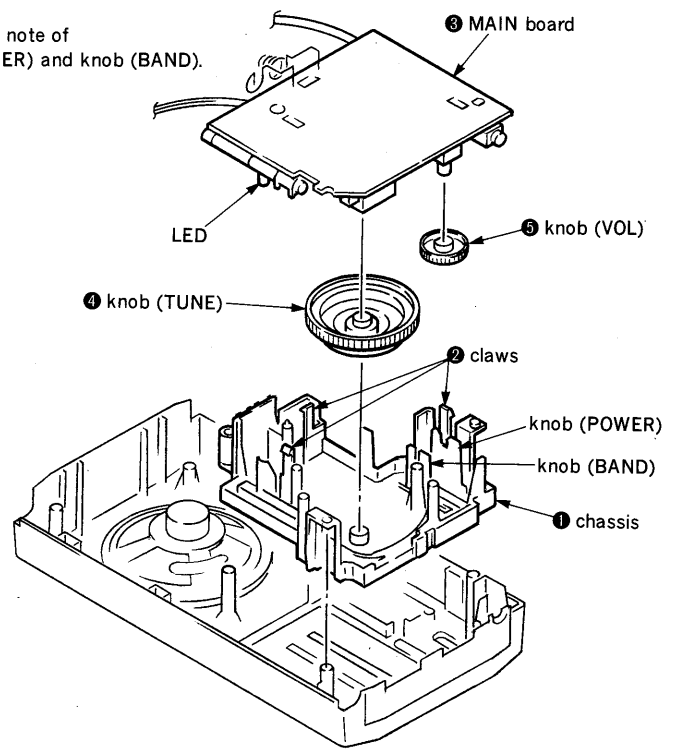
3-1. CABINET (REAR) ASSY



3-2. MAIN BOARD

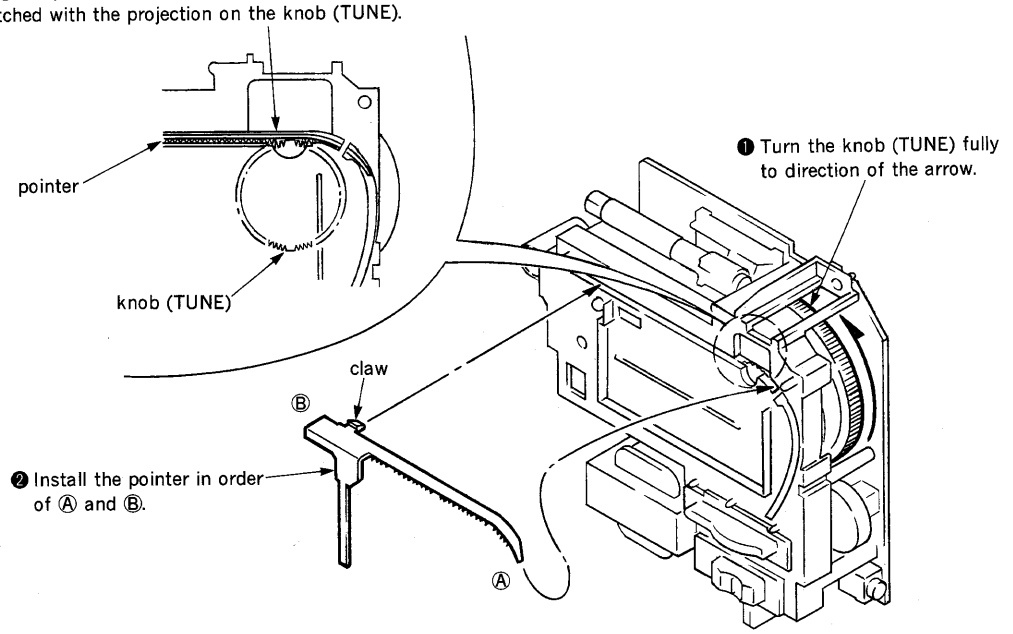
Note for Installation :

When installing the main board, take note of the positions of the LED, knob (POWER) and knob (BAND).



3-3. POINTER SETTING

When installing the pointer, the depression on it should be matched with the projection on the knob (TUNE).

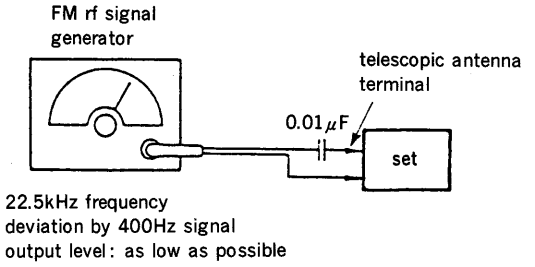


SECTION 4
ELECTRICAL ADJUSTMENTS

• FM Section

Setting :

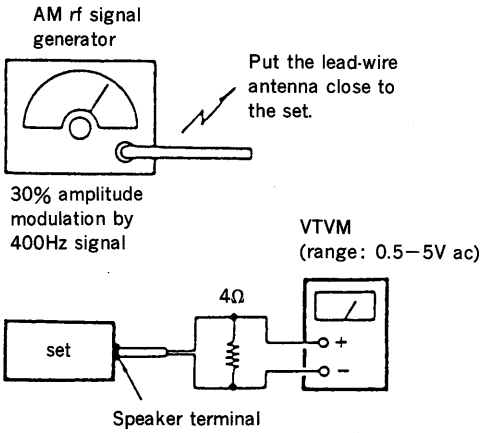
BAND switch : FM


FM rf signal generator
telescopic antenna terminal
0.01μF
set
22.5kHz frequency deviation by 400Hz signal output level: as low as possible

• AM Section

Setting :

BAND switch : AM



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Remove telescopic antenna in FM section adjustments.

FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L3	CT3
86.5MHz (64.0MHz)	109.5MHz

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L2	CT2
86.5MHz (64.0MHz)	109.5MHz

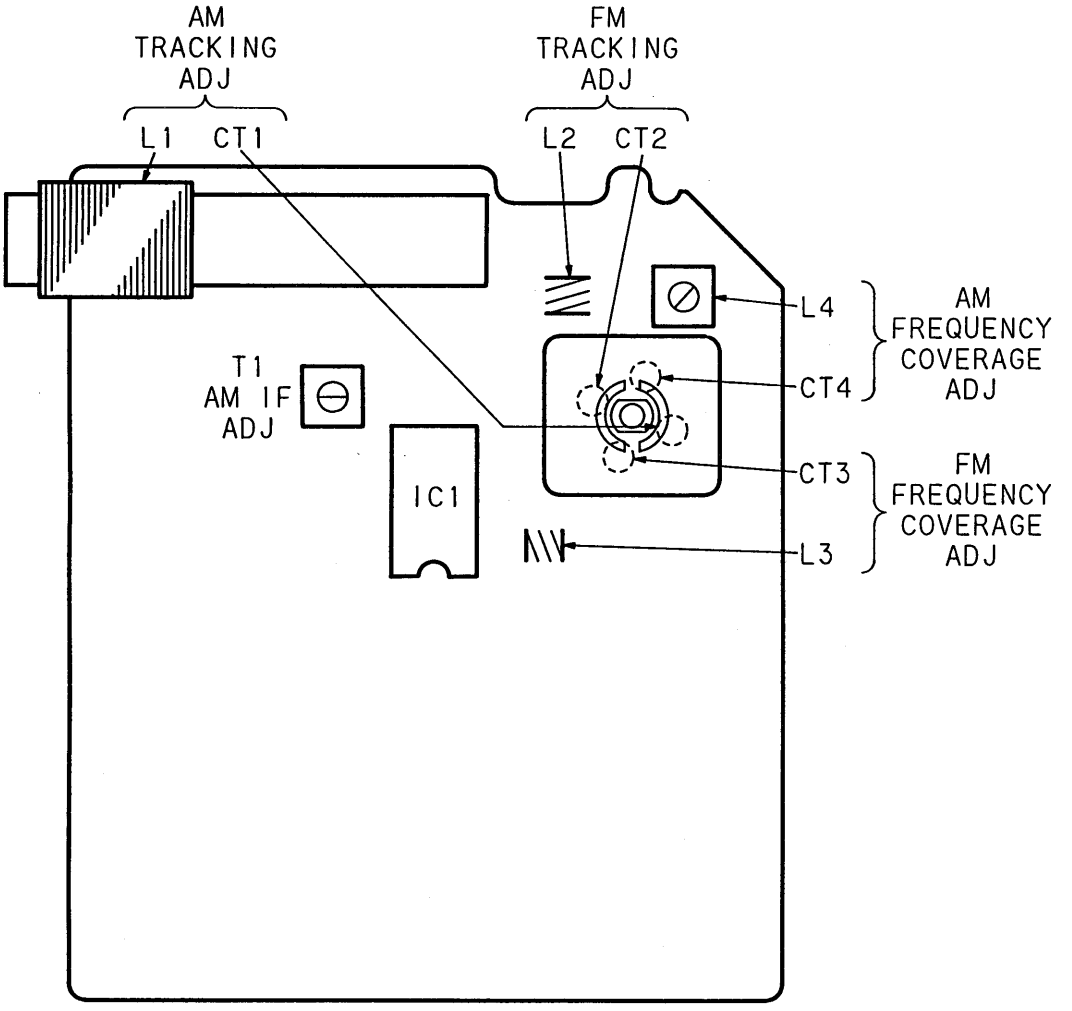
AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L4	CT4
520kHz	1,750kHz

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L1	CT1
600kHz	1,400kHz

AM IF ADJUSTMENT
Adjust for a maximum reading on VTVM.
T1
455kHz

( ) : East European model

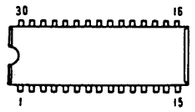
Adjustment Location : main board (component side)



SECTION 5
DIAGRAMS

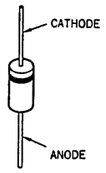
5-1. SEMICONDUCTOR LEAD LAYOUTS

CXA1019S

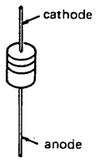


(Top view)

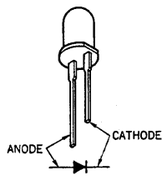
1N4002L



1SS133



LN21RPL



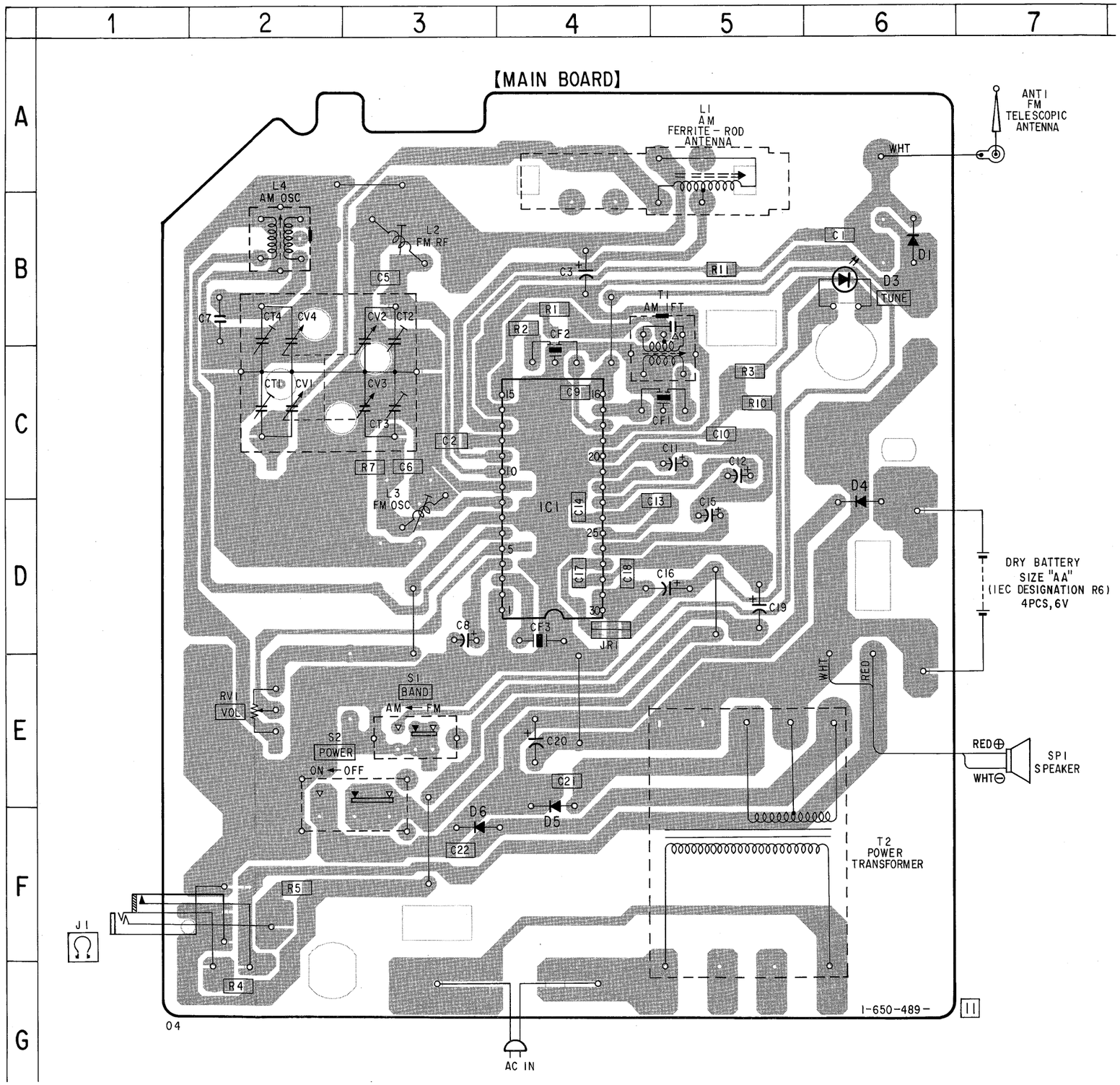
• Semiconductor Location

Ref. No.	Location
D1	B-6
D3	B-6
D4	C-6
D5	F-4
D6	F-3
IC1	C-4

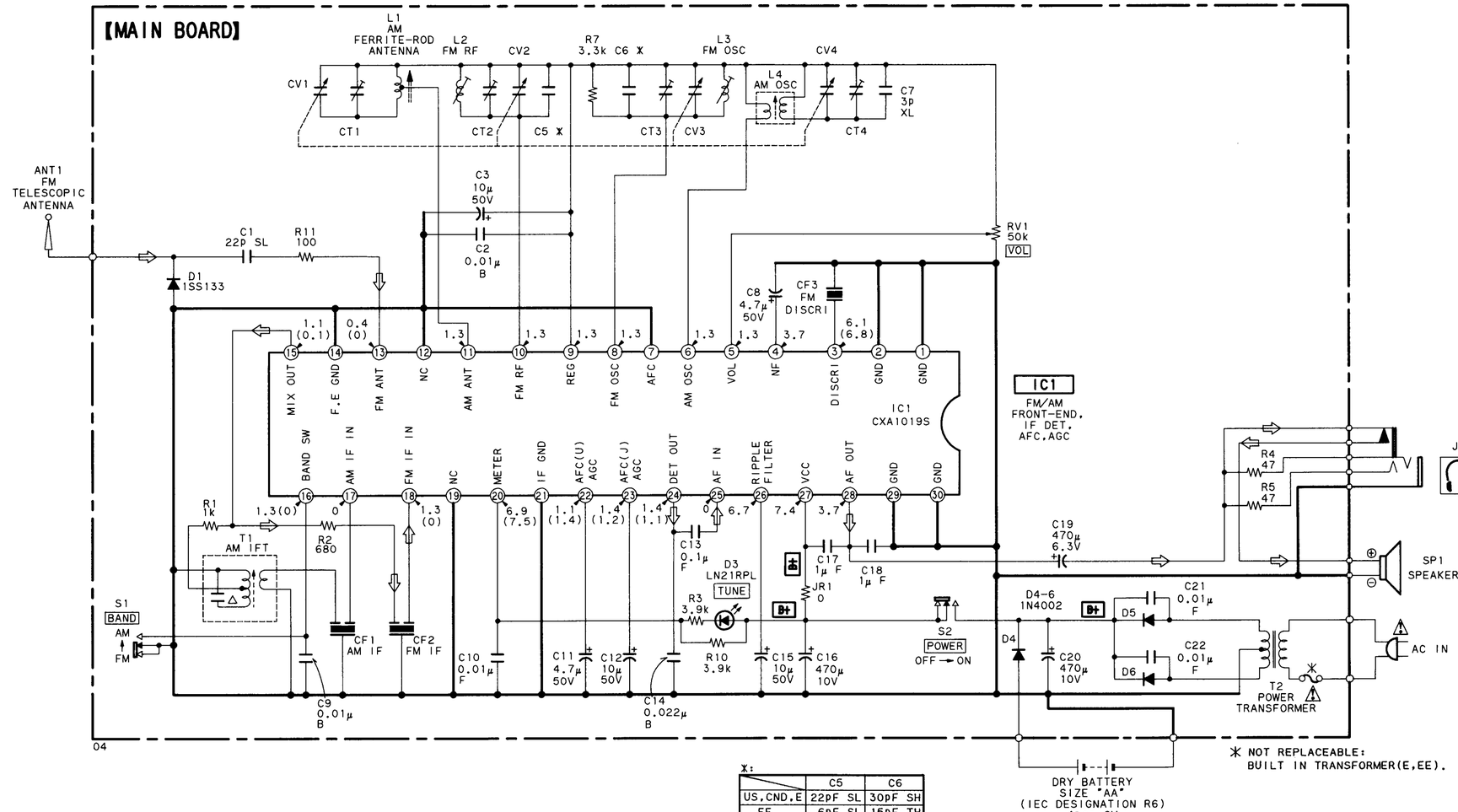
Note :

- ○— : parts extracted from the component side.
- —□ : indicates side identified with part number.
- ▨ : Pattern on the side which is seen.

5-2. PRINTED WIRING BOARD



5-3. SCHEMATIC DIAGRAM

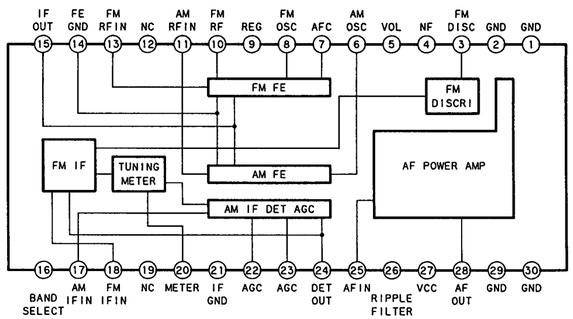


X:

	C5	C6
US,CND,E	22pF SL	30pF SH
EE	6pF SL	15pF TH

• IC Block Diagram

IC1 CXA1019S



Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- B+ : B+ Line
- Voltage is dc with respect to ground under no-signal (detuned) conditions.
- no mark: FM
  ( ): AM
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM

- Abbreviations
  CND : Canadian model
  EE : East European model

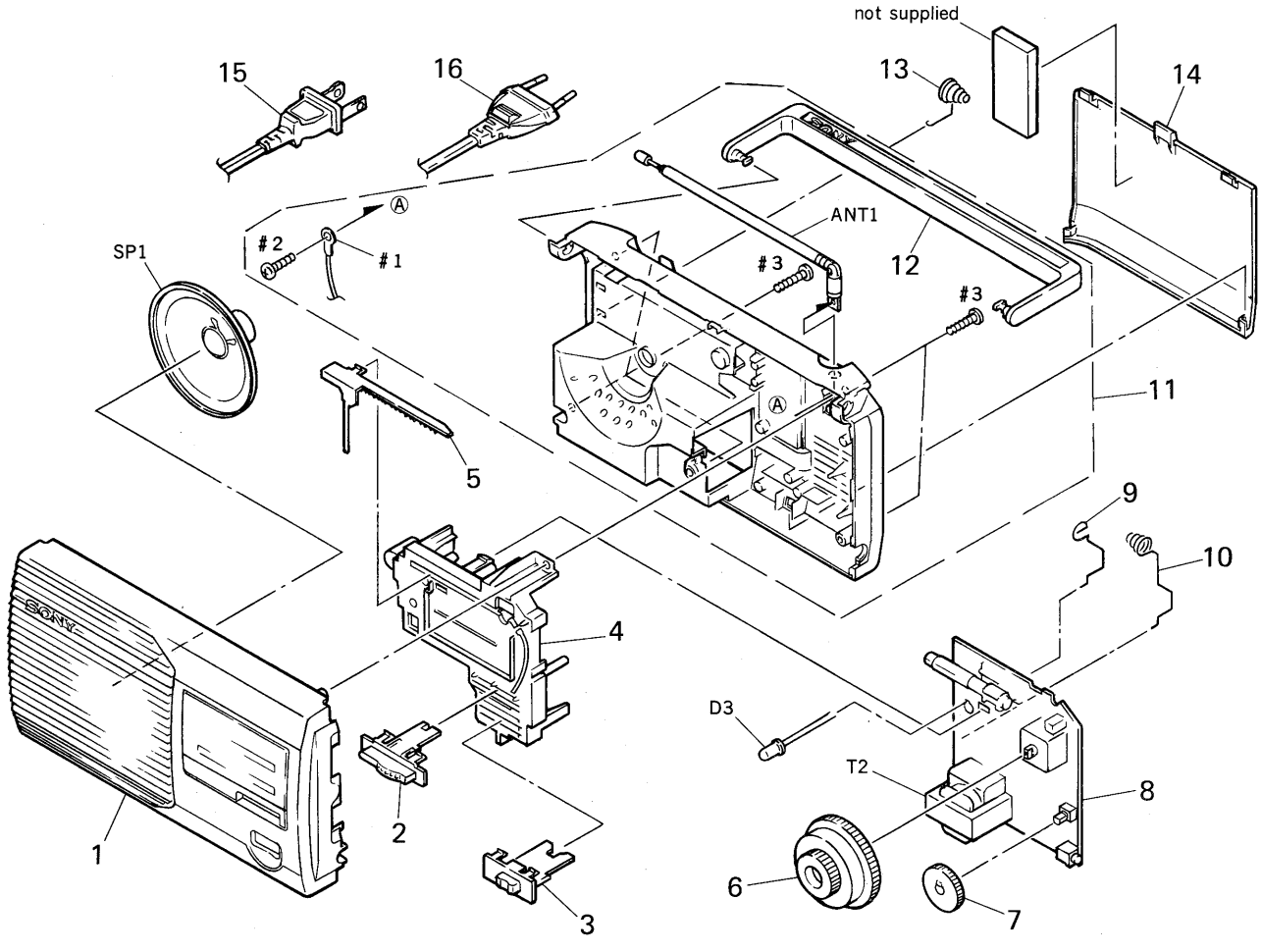
SECTION 6
EXPLODED VIEW

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE)... (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Ref. No.	Part No.	Description	Remark
* 1	X-3367-535-1	CABINET (FRONT) ASSY (US, Canadian, E)	
* 1	X-3367-705-1	CABINET (FRONT) ASSY (East European)	
2	3-908-112-01	KNOB (BAND)	
3	3-908-113-01	KNOB (POWER)	
* 4	3-908-107-01	CHASSIS	
5	3-908-109-01	POINTER	
6	3-908-110-01	KNOB (TUNE)	
7	3-908-111-01	KNOB (VOL)	
* 8	A-3661-913-A	MAIN BOARD, COMPLETE (US, Canadian)	
* 8	A-3661-922-A	MAIN BOARD, COMPLETE (East European)	
* 8	A-3679-671-A	MAIN BOARD, COMPLETE (E)	
* 9	3-908-115-01	TERMINAL (+), BATTERY	
* 10	3-908-116-01	SPRING (-), BATTERY COIL	

Ref. No.	Part No.	Description	Remark
* 11	A-3635-977-A	CABINET (REAR) ASSY (US, Canadian)	
* 11	A-3635-988-A	CABINET (REAR) ASSY (East European, E)	
* 12	3-908-130-01	HANDLE	
* 13	3-908-117-01	SPRING (+/-), BATTERY COIL	
14	3-908-131-01	LID, BATTERY CASE	
⚠15	1-696-008-11	CORD, POWER (US, Canadian)	
⚠16	1-555-795-00	CORD, POWER (East European, E)	
ANT1	1-501-222-62	ANTENNA, TELESCOPIC (FM)	
D3	8-719-042-69	LED LN21RPL (TUNE)	
SP1	1-544-518-11	SPEAKER	
⚠T2	1-423-878-11	TRANSFORMER, POWER (US, Canadian)	
⚠T2	1-450-324-11	TRANSFORMER, POWER (East European, E)	

SECTION 7
ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
*	A-3661-913-A	MAIN BOARD, COMPLETE (US, Canadian)			
*	A-3661-922-A	MAIN BOARD, COMPLETE (East European)			
*	A-3679-671-A	MAIN BOARD, COMPLETE (E)			
		**********			
*	1-535-771-11	TERMINAL (East European, E)			
		< CAPACITOR >			
C1	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C2	1-163-059-91	CERAMIC CHIP	0.01uF	10%	50V
C3	1-124-907-11	ELECT	10uF	20%	50V
C5	1-163-089-00	CERAMIC CHIP (East European)	6PF		50V
C5	1-163-101-00	CERAMIC CHIP (US, Canadian, E)	22PF	5%	50V
C6	1-163-097-00	CERAMIC CHIP (East European)	15PF	5%	50V
C6	1-163-104-00	CERAMIC CHIP (US, Canadian, E)	30PF	5%	50V
C7	1-102-936-00	CERAMIC	3PF	0.25PF	50V
C8	1-124-927-11	ELECT	4.7uF	20%	100V
C9	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C10	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C11	1-124-927-11	ELECT	4.7uF	20%	100V
C12	1-124-907-11	ELECT	10uF	20%	50V
C13	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C14	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C15	1-124-907-11	ELECT	10uF	20%	50V
C16	1-124-472-11	ELECT	470uF	20%	10V
C17	1-164-346-11	CERAMIC CHIP	1uF		16V
C18	1-164-346-11	CERAMIC CHIP	1uF		16V
C19	1-124-472-11	ELECT	470uF	20%	10V
C20	1-124-472-11	ELECT	470uF	20%	10V
C21	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C22	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< FILTER >			
CF1	1-577-072-11	FILTER, CERAMIC			
CF2	1-760-144-61	FILTER, CERAMIC			
CF3	1-760-144-61	FILTER, CERAMIC			

Ref. No.	Part No.	Description			Remark
		< VARIABLE CAPACITOR >			
CT1-4, CV1-4	1-151-631-11	CAP, VARIABLE (TUNE) (US, Canadian, E)			
CT1-4, CV1-4	1-151-633-11	CAP, VARIABLE (TUNE) (East European)			
		< DIODE >			
D1	8-719-901-33	DIODE 1SS133			
D3	8-719-042-69	LED LN21RPL (TUNE)			
D4	8-719-031-85	DIODE 1N4002L			
D5	8-719-031-85	DIODE 1N4002L			
D6	8-719-031-85	DIODE 1N4002L			
		< IC >			
IC1	8-752-035-29	IC CXA1019S			
		< JACK >			
J1	1-566-891-21	JACK (headphones)			
		< JUMPER RESISTOR >			
JR1	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L1	1-402-464-11	ANTENNA, FERRITE-ROD (AM)			
L2	1-402-654-11	COIL, AIR-CORE (US, Canadian, E)			
L2	1-428-104-11	COIL, AIR-CORE (East European)			
L3	1-402-654-11	COIL, AIR-CORE (East European)			
L3	1-428-222-11	COIL, AIR-CORE (US, Canadian, E)			
L4	1-406-028-00	COIL, OSC (AM)			
		< RESISTOR >			
R1	1-216-049-00	METAL CHIP	1K	5%	1/10W
R2	1-216-045-00	METAL CHIP	680	5%	1/10W
R3	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R4	1-216-017-00	METAL CHIP	47	5%	1/10W
R5	1-216-017-00	METAL CHIP	47	5%	1/10W
R7	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R10	1-216-063-00	METAL CHIP	3.9K	5%	1/10W

MAIN

Ref. No.	Part No.	Description	Remark
R11	1-216-025-00	METAL CHIP 100 5% 1/10W	
		< VARIABLE RESISTOR >	
RV1	1-241-542-11	RES, VAR, CARBON 50K (VOL)	
		< SWITCH >	
S1	1-571-478-11	SWITCH, SLIDE (BAND)	
S2	1-692-843-11	SWITCH, SLIDE (POWER)	
		< TRANSFORMER >	
T1	1-404-790-11	TRANSFORMER, IF	
⚠T2	1-423-878-11	TRANSFORMER, POWER (US, Canadian)	
⚠T2	1-450-324-11	TRANSFORMER, POWER (East European, E)	
		MISCELLANEOUS	
⚠15	1-696-008-11	CORD, POWER (US, Canadian)	
⚠16	1-555-795-00	CORD, POWER (East European, E)	
ANT1	1-501-222-62	ANTENNA, TELESCOPIC (FM)	
SP1	1-544-518-11	SPEAKER	
		ACCESSORIES & PACKING MATERIALS	
	3-757-963-21	MANUAL, INSTRUCTION (ENGLISH) (US)	
	3-757-963-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH) (Canadian)	
	3-757-963-51	MANUAL, INSTRUCTION (ENGLISH, POLISH, RUSSIAN, CZECH, HUNGARIAN) (East European)	
	3-758-396-61	MANUAL, INSTRUCTION (ENGLISH) (E)	
*	3-909-032-01	INDIVIDUAL CARTON (US, E, East European)	
*	3-909-034-01	CUSHION	
*	3-909-164-01	INDIVIDUAL CARTON (Canadian)	
		HARDWARE LIST	
#1	7-623-508-01	LUG, 3	
#2	7-685-134-19	SCREW +P 2.6X8 TYPE2 NON-SLIT	
#3	7-685-549-11	SCREW +BTP 3X14 TYPE2 N-S	

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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